

WHAT IS CLAIMED IS:

1. An electrochromic or electrodeposition display comprising a plurality of cells, each of said cells comprises:
 - (a) surrounding partition walls,
 - (b) an electrochromic fluid or electrolytic fluid filled therein, and
 - (c) a polymeric sealing layer which encloses the electrochromic fluid or electrolytic fluid within each cell and sealingly adheres to the surface of the partition walls.
2. The display of Claim 1 wherein said electrochromic fluid or electrolytic fluid is partially filled.
3. The display of Claim 2 wherein said polymeric sealing layer is in contact with said partially filled electrochromic fluid or electrolytic fluid.
4. The display of Claim 1 wherein said electrolytic fluid comprising a metal salt dissolved in a solvent or in a polymer matrix.
5. The display of Claim 4 wherein said metal salt is a silver salt.
6. The display of Claim 5 wherein said silver salt is silver halide or silver nitrate.
7. The display of Claim 4 wherein said polymer matrix is formed of a material selected from a group consisting of poly(ethylene oxide), polyvinylpyrrolidone, hydroxyethyl cellulose, hydroxypropyl cellulose, methyl cellulose, gelatin, gum Arabic and their copolymers.
8. The display of Claim 4 wherein said solvent is a non-aqueous solvent.

9. The display of Claim 8 wherein said non-aqueous solvent is selected from a group consisting of dimethylsulfoxide (DMSO), dimethyl formamide (DMF), diethyl formamide (DEF), N, N-dimethylacetamide (DMAA), N-methylpropionic acid amide, N-methylpyrrolidone, propylene carbonate, acetonitrile, 2-methoxyethanol, 2-ethoxyethanol, dimethoxymethane (DME), glycerine carbonate, 2-methylglutaronitrile and γ -butyrolactone.

10. The display of Claim 4 wherein said solvent is a mixture of aqueous and non-aqueous solvents.

11. The display of Claim 4 wherein the concentration of said metal salt is from about 0.03 to about 2.0 mol/L.

12. The display of Claim 11 wherein the concentration of said metal salt is from about 0.05 to about 2.0 mol/L.

13. The display of Claim 4 wherein said electrolytic fluid further comprising a supporting electrolyte.

14. The display of Claim 13 wherein said supporting electrolyte is lithium halide, sodium halide, potassium halide, calcium halide or a halogenated quaternary ammonium salt.

15. The display of Claim 13 wherein the concentration of said supporting electrolyte is from about 0.5 to about 5 times said metal salt.

16. The display of Claim 1 wherein said electrochromic fluid comprises a redox chromophore, an electrolyte and an inert solvent.

17. The display of Claim 16 wherein said redox chromophore is a viologen derivative.

18. The display of Claim 17 wherein said viologen is bis (2-phosphonoethyl)-4,4'-bipyridinium dichloride.
19. The display of Claim 16 wherein said electrolyte is lithium perchlorate (LiClO_4), lithium triflate ($\text{Li}(\text{F}_3\text{CSO}_3)$) or tetrabutylammonium (TBA) triflate.
20. The display of Claim 16 wherein said inert solvent is γ -butyrolactone or 3-methoxypropionitrile.
21. The display of Claim 16 wherein said electrochromic fluid further comprising white pigment particles of rutile titania, BaSO_4 or zinc oxide.
22. An electrochromic or electrodeposition display comprising
 - a) a top electrode plate and a bottom electrode plate, at least one of which is transparent; and
 - b) a plurality of cells enclosed between the two electrodes, each of said cells comprising
 - (i) surrounding partition walls,
 - (ii) an electrochromic fluid or electrolytic fluid filled therein, and
 - (iii) a polymeric sealing layer which encloses the electrochromic fluid or electrolytic fluid within each cell and sealingly adheres to the surface of the partition walls.
23. The display of Claim 22 wherein the thickness of the bottom of said cells is less than about $2\mu\text{m}$.
24. The display of Claim 23 wherein the thickness of the bottom of said cells is less than about $1\mu\text{m}$.
25. The display of Claim 22 wherein said cells are formed of a composition comprising a thermoplastic, thermoset or a precursor thereof.

26. The display of Claim 25 wherein said composition further comprises a gas absorbing material.

27. The display of Claim 26 wherein said gas absorbing material is a chlorine, hydrogen or oxygen absorbing material.

28. The display of Claim 27 wherein said chlorine, hydrogen or oxygen absorbing material is selected from a group consisting of rubbers, nitrile rubbers, styrene-butadiene copolymers and norborenes.

29. The display of Claim 27 wherein said composition further comprises a catalyst for a hydrogenation or oxidation reaction.

30. The display of Claim 29 wherein said catalyst is a complex of Co or V.

31. The display of Claim 30 wherein said complex of Co or V is Co acetoacetate, Co acetylacetone, V acetoacetate or V acetylacetone.

32. The display of Claim 22 wherein said polymeric sealing layer is formed from a composition comprising a thermoplastic, a thermoset or a precursor thereof .

33. The display of Claim 32 wherein said composition further comprises a chlorine, hydrogen or oxygen absorbing material.

34. The display of Claim 33 wherein said chlorine, hydrogen or oxygen absorbing material is selected from a group consisting of rubbers, nitrile rubbers, styrene-butadiene copolymers and norborenes.

35. The display of Claim 32 wherein said composition further comprises particles or fibers of a conductive polymer or a doped derivative thereof, carbon black, graphite, a metal oxide or metal.

36. The display of Claim 22 wherein said sealing layer has a vertical conductivity (conductivity in the direction perpendicular to the electrode film) and a horizontal conductivity (the conductivity in the direction parallel to the electrode film), and said vertical conductivity is higher than said horizontal conductivity.

37. The display of Claim 35 wherein said conductive particles have a concentration from about 1 to about 20% by volume.

38. The display of Claim 37 wherein said concentration of said conductive particles is from about 5 to about 15% by volume.

39. The display of Claim 1 wherein said polymeric sealing layer is formed from a composition comprising a thermoplastic elastomer, a diene rubber, a polyurethane or a block copolymer thereof.

40. The display of Claim 39 wherein said thermoplastic elastomer is a Kraton polymer.

41. The display of Claim 39 wherein said diene rubber is polybutadiene, polychloroprene, polyisoprene or poly(styrene-co-butadiene).

42. The display of Claim 39 wherein said composition is in a solvent selected from a group consisting of methyl ethyl ketone (MEK), methyl propyl ketone, ethyl acetate, isopropyl acetate, butyl acetate, toluene, xylene, alkanes such as Isopar solvents, cyclohexane, heptane, octane, nonane, decane, decalin, dodecane and dodecylbenzene.

43. The display of Claim 22 wherein said top electrode plate is laminated over said polymeric sealing layer with an adhesive layer.

44. The display of Claim 43 wherein said adhesive layer further comprises a gas absorbing material such as a chlorine, hydrogen or oxygen absorbing material.

45. The display of Claim 44 wherein said chlorine, hydrogen or oxygen absorbing material is selected from a group consisting of rubbers, nitrile rubbers, styrene-butadiene copolymers and norbornenes.

46. The display of Claim 43 wherein said polymeric adhesive layer further comprises particles or fibers of a conductive polymer or a doped derivative thereof, carbon black, graphite, a metal oxide or metal.

47. The display of Claim 43 wherein said adhesive layer has a vertical conductivity (conductivity in the direction perpendicular to the electrode film) and a horizontal conductivity (the conductivity in the direction parallel to the electrode film), and said vertical conductivity is higher than said horizontal conductivity.

48. The display of Claim 22 further comprising a primer layer between the cells and said bottom electrode plate.

49. The display of Claim 48 wherein said primer layer comprises particles or fibers of a conductive polymer or a doped derivative thereof, carbon black, graphite, a metal oxide or metal.

50. The display of Claim 48 wherein said primer layer comprises a gas absorbing material.

51. The display of Claim 1 wherein said electrochromic or electrodeposition fluid further comprises density-matched reflecting particles.

52. The display of Claim 51 wherein said density-matched reflecting particles are formed of TiO_2 , ZnO , $BaSO_4$ or silica.

53. A process for the preparation of an electrochromic or electrodeposition display, which process comprises the steps of:

- a) embossing a thermoplastic or thermoset precursor layer with a pre-patterned male mold;
- b) hardening the thermoplastics or thermoset precursor layer;
- c) releasing the mold from the thermoplastic or thermoset precursor layer;
- d) filling the thus-formed array of microcups with an electrochromic or electrodeposition fluid; and
- e) sealing the filled microcups.

54. A process for the preparation of an electrochromic or electrodeposition display, which process comprises:

- a) embossing a thermoplastic or thermoset precursor layer with a pre-patterned male mold;
- b) hardening the thermoplastic or thermoset precursor layer;
- c) releasing the mold from the thermoplastic or thermoset precursor layer;
- d) treating the microcups with an oxidant or staining agent;
- e) rinsing the treated microcups with a solvent or an aqueous solution to remove the residual oxidant or staining agent;
- f) filling the thus-formed array of microcups with an electrochromic or electrodeposition fluid; and
- g) sealing the filled microcups.

55. The process of Claim 54 wherein said oxidant or staining agent is a solution of OsO_4 , KMnO_4 or K_2CrO_7 .

56. A process for the preparation of an electrochromic or electrodeposition display, which process comprises the steps of:

- a) coating a layer of radiation curable composition on a conductor film;
- b) imagewise exposing the radiation curable layer;
- c) removing the unexposed areas by a developer or solvent to reveal an array of microcups;
- d) filling the microcups with an electrochromic or electrodeposition fluid; and
- e) sealing the filled microcups.

57. A process for the preparation of an electrochromic or electrodeposition display, which process comprises:

- a) filling the microcups with an electrochromic or electrodeposition fluid and a dispersion of a polymeric sealing composition which has a specific gravity lower than that of the electrochromic or electrodeposition fluid; and
- b) sealing the microcups by curing the polymeric sealing composition during or after it phase separates and forms a supernatant layer above the electrochromic or electrodeposition fluid.

58. A process for the preparation of an electrochromic or electrodeposition display, which process comprises:

- a) filling the microcups with an electrochromic or electrodeposition fluid;
- b) overcoating onto said electrochromic or electrodeposition fluid a polymeric sealing composition which is at least partially immiscible with said electrochromic or electrodeposition fluid and has a specific gravity lower than that of the electrochromic or electrodeposition fluid, and
- c) sealing the microcups by curing said polymeric sealing composition.

59. The electrochromic or electrodeposition display of Claim 1 wherein said polymeric sealing layer is formed from a composition having a specific gravity lower than that of the electrochromic or electrolytic fluid.

60. The electrochromic or electrodeposition display of Claim 22 wherein said polymeric sealing layer is formed from a composition having a specific gravity lower than that of the electrochromic or electrolytic fluid.